

A REVISED SYNOPSIS OF THE WHITE PINES

(PINUS, SECTION QUINQUEFOLIIS)

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ABSTRACT

A revised subdivision of the 11 species of section Quinquefoliis emend. (Synonym: section Strobus emend.) is proposed in accordance with the principles of Philosophia botanica by Linné. The basis of the section (emended here) is the long, effective seed wing, and the basis of the 3 subsections is highly practical: it uses the characters of the cones, often found lying on the ground under the trees. The subsections possess satisfactory coherence, both morphologically and geographically.

INTRODUCTION

This synopsis revises the ones previously written by myself (Landry 1974 and 1977) wherein sections and series had been segregated. While time marches on, the human person has a natural tendency to change her mind according to the experience gained. I now think that for a genus of less than 100 species, it is not necessary to use series. The divisional rank of subgenus and the subdivisional ranks of section and subsection do suffice. I concur in that respect with Engler, Gausson, Little & Critchfield, Pilger, Shaw and many others. However, the classifications now extant need further refining, new subgeneras, sections and subsections could be created for outstanding species and groups of species.

The treatment that we propose hereunder: 1) is in accordance with Linné (1751); 2) it is also the logical suite of the conclusions of Critchfield (1986); 3) above all, it is highly practical.

Here is a short development of those 3 bases: 1) A decade ago (Landry, 1979) we had published a fundamental analysis of the ways of classifying the divisions and the subdivisions of a higher plant genus. We had taken the example of the genus PINUS. To our astonishment, the unanimity did not exist between 10 sys-

tematicians on how to proceed and on what kind of basic data should be used. Consequently, the results and conclusions differed widely from author to author. We then commented such a "tragic" situation and made ourselves this sentence of Gausson (1960, p. 17): "Classification clashes with the defects of all (plant) classifications: to group together all (the species) which resemble each other means that we place together (species) in a similar evolutive state: it does not mean grouping together closely related species." We had then concluded that for the time being - i.e. until we finally understand the process of evolution - the most practical way to classify plants remains to follow the ideas of Linné (1751) who chose the reproductive system as a main basis to plant classification. Why? Because, its morphology is more refined. Why simplify and use only morphology? Because confusion tends to happen when we take into consideration more than one kind of data.

2) Critchfield (1986, p. 654) confirmed our opinion when he wrote this: "The contradictions between reproductive characters, vegetative morphology, crossing data and biochemical variations appear to be irreconcilable".

3) Our system is moreover a system of maximal practicability. It follows the simplest dendrological rule of considering just what is most easily seen and found, namely macroscopic morphological characters and easily picked up material. To fulfill such a prerequisite, the taxons hereunder proposed are diagnostically described by means of just the cones, including the trace left by the seeds on the underside of the scales. No conelets to scrutinize, no strobiles. It is so easier to simply pick up the cones as they very often lie on the ground under the mature trees. Even half rotten cones will suffice. The only other character used is the stature of the trees (very large, large, medium) but it is not neatly diagnostic; only indicative.

The material observed was mostly located in the Dominion Arboretum at Ottawa, the Arnold Arboretum at Cambridge, Mass., the Strybing Arboretum at San Francisco. We also studied in situ the Cordilleran species and Pinus strobus.

SECTION QUINQUEFOLIIS EMEND.

This epithet was first validly published by Duhamel du Monceau (1755, vol.2, p.127). Duhamel included 2 species: P. cembra and P. strobus. Then Little & Critchfield (1969, p.8) selected P. strobus as the lectotype species. Now, here we emend the diagnostic characters and the circumscription of the section as follows: semina alata normalis, umbone terminali, that is: long, effective seed wing, umbo terminal. By doing so we separate section Quinquefoliis from section Cembra characterized by seeds wingless or with short, non effective wings (i.e. shorter than the body of the seeds) in addition to the terminal umbo. Why give here so much importance to the long, effective seed wing? Because there is an important geographic correlation: section Quinquefoliis is much less continental than section Cembra. In a subsequent paper we will develop this fact.

The following key takes into account the cone apophyses dimensions and the length of the seed wings. Regarding the apophyse we had considered also the degree of their reflexion but we finally found that it was not always clear. Pinus ayacahuite, for exemple sometimes has all its apophysis reflexed, sometimes only the upper third. And Pinus monticola has sometimes a fifth, sometimes half.

KEY TO THE SUBSECTIONS OF  
SECTION QUINQUEFOLIIS

1. Cone relatively light: the midcone apophysis are narrow (10-27 mm) and thin (2-3 mm).....2
2. Seed wing (at midcone) 2 times or more longer than the body of the seed .....subsection Strobi
2. Seed wing (at midcone) 1-2 times longer than the body of the seed .....subsection Gojiae
1. Cone relatively heavy: the midcone apophysis are wide (30-35 mm) and thick (5-6 mm).....subsection Nat-clehianae

## SUBSECTION STROBI EMEND.

First valid publication: Loudon (1838, p.2280) who listed P. strobis (here selected as the lectotype), and also P. lambertiana P. monticola and P. wallichiana. He insisted that P. strobis and P. wallichiana were very similar.

As emended here, this subsection now comprises 7 species. We describe it as follows: umbo terminal, rather light cones and very long seed wings (at least twice longer than the length of the seed itself). They are: Pinus strobis (type), and P. ayacahuite, P. chiapensis, P. dalatensis, P. monticola, P. peuce, and P. wallichiana.

Interested like the psalmist who sung: "Great are the works of Adonai YHVH, studied by those who want them", I would like to know why those 7 species are specially distributed. Right now, we can notice 3 first facts: globally (1) that subsection is relatively southerly and (2) it is situated not too far from ancient or present seas or oceans, and (3) we find it distributed around the Northern Hemisphere except in the Extreme Orient where subsection Gojae gradually replaces it.

## SUBSECTION GOJAE

Subsection Gojae n. subsect. Umbone terminali, apophysis comparate paucis grandibus, semina ala brevia separabili (ala 1-2X semina). Holotypus: Pinus morrisonicola Hayata. - Subsection Gojae n. subsect. Terminal umbo, apophysis comparatively smaller, seed-wing short (wing 1-2 times the length of the body of the seed). - Sous-section Gojae n. subsect. Ombilic terminal, apophyses comparatively petites, graines munies d'ailes courtes (1-2 fois la longueur du corps de la graine).

That name is from a sino-japanese root meaning "five leaves".

This series comprises Pinus kwangtungensis, Pinus morrisonicola (type) and Pinus pentaphylla. Concerning Pinus wangii, we consider it a species dubium. I respectfully pray here the esteemed Chinese dendrologists to furnish me with informations and specimens of taxon wangii, very closely related to Pinus

kwangtungensis.

The said 3 species grow not far from the sea in the southeastern Extreme Orient. They are medium trees commonly attaining 25-30 m.

Pinus pentapnylla is the right name of the Japanese White Pine, due to the fact that the complex Pinus X parviflora is a group of nothomorphs of Pinus pentapnylla hybridized with Pinus pumila. Please read more below about this subject.

## SUBSECTION NAT-CLEHIANAE

Subsection Nat-clehianae n. subsect. Umbone terminali, apopnysi comparate grandior: 30-35 mm lata, 5-6 mm crassa; pedunculatum conis 5-15 cm longus. Monotypicus: Pinus lambertiana Douglas. - Subsection Nat-clehianae n. subsect. Terminal umbo, apophysis comparatively bigger: width 30-35 mm, thickness 5-6 mm; length of cone peduncle 5-15 cm. I add this: the apophysis are lustrous when green or fresh or when the cones are just fallen on the ground (before they start rotting). - Sous-section Nat-clehianae n. subsect. Umbilic terminal, apopnyses comparativement plus grosses: largeur 30-35 mm, épaisseur 5-7 mm; longueur du pédoncule du cône 5-15 cm. J'ajoute que les apophyses sont lustrées lorsque vertes ou fraîches ou quand le cône vient de tomber au sol (avant qu'il commence à pourrir).

Please see the herewith drawing, which shows cones of (from left to right): Pinus ayacahuite (not entirely open), P. monticola, P. strobus and P. Lambertiana. Two of the main differences separating Pinus Lambertiana are shown: much wider midcone scales; much longer cone peduncle.

This subsection is made of very large trees commonly attaining 45-60 m, i.e. by far the largest trees of the genus Pinus. Their silhouette is also unique: near the top of the crown of mature trees, we notice very long horizontal branches terminated by the big cones easily seen from a distance. The poet John Muir in The Mountains of California, p.158, was amazed by its special appearance: "Notwithstanding they are ever tossing their immense arms in what might seem most extravagant gestures, there is a majesty and repose about them that precludes all possibility of the grotesque, or even picturesque, in their general expression".

(Cited by Sargent, 1897, p.30). I have observed them in the vicinity of mount Shasta, as isolated trees, and fully concurr.

The name of this subsection is taken from the writings of the discoverer of Pinus lambertiana (i.e. Douglas, 1827, p. 499): "The vernacular name of (that Pine), in the language of the Umpqua Indians, is Nat-cleh." There for me remains to know exactly what that name means.

It is not necessarily because the tree is a giant that the cones are massive. The Sequoias, for example, have relatively small cones.

#### KNOWN NATURAL HYBRIDS

The intermediate morphological characters and the actual geographical range of the following 3 hybrid species indicate that they are relict hybrid swarms. We now know that a lack of present range overlap by the parent species is not a sine qua non condition for recognizing hybrids.

- Pinus X bhutanica = P. armandii X P. wallichiana. Please read Grierson et al. (1980) who described it as a species.

- Pinus X parviflora = P. pentaphylla X P. pumila. Here the best reference is Mayr (1980, p. 78-80).

We add that the shape of the scales is about rounded, i.e. ad media res between Pinus pentaphylla (scales longer) and Pinus pumila (scales wider). The cones also do not open much, they are sometimes barely dehiscent. The seedwings are quite short and quite fragile, a character that situate them near the lack of spermoderm of Pinus pumila. The reader is referred to a very excellent illustration of one of the nothomorphs of Pinus X parviflora by the Japan Forest Technical Association (1964, p.34-35, pl. 17).

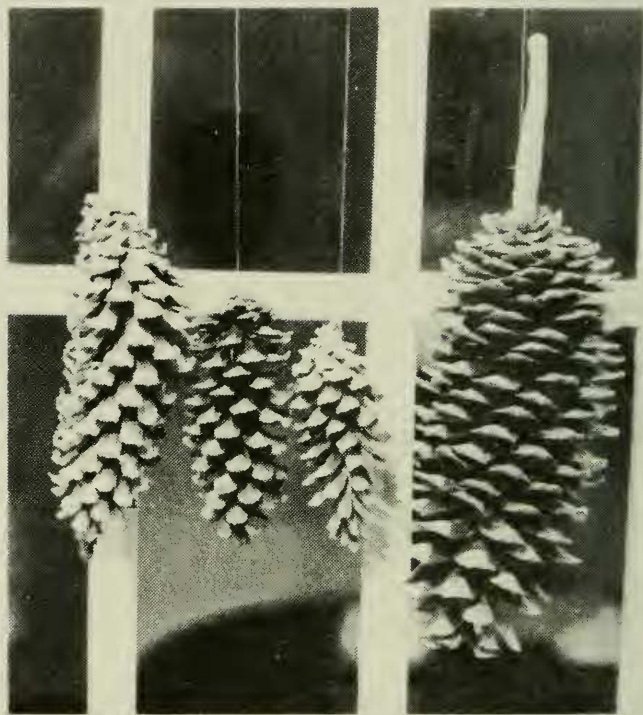
- Pinus X veitchii = P. ayacahuite X P. strobiformis. Please consult Shaw (1909, p.10).

#### RECOGNITION

This paper is published to honor William B. Critchfield in recognition for his first order contribution to the knowledge of the genus Pinus since over 30 years.

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Cones of (from left to right): Pinus ayacahuite (not entirely open), P. monticola, P. strobus and P. lambertiana. Two of the main differences separating Pinus lambertiana are shown: much wider midcone scales; much longer cone peduncle.